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AUTHOR: ⑧ Borkowski, Szczepan

TITLE: ⑥ Computation of stress in an open cylindrical shell under the action of centrifugal force

PERIODICAL: ⑮ TRANS. FROM. Rozprawy inżynierskie, v. 10; no. 3, 1962, pp. 459-495

TEXT: The problem of discontinuous stresses is solved for an open cylindrical shell consisting of two cylindrical shells of revolution with different radii of curvature, loaded by centrifugal force. Shells of this type are used for blades in radial pumps, compressors and blowers. Simplified equations of Donnell, Vlasov and Flügge are reduced to one equation by means of a complex function and integrated by Levy's method. Integration constants are found from the boundary conditions and a scheme is given for transformation of coefficients and consequent use of the formulas for both shells. Analysis of three numerical examples shows that largest stresses occur along the edge farthest from the axis of revolution, and for some materials, approach the critical values. For an

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Computation of stress ...

S-shaped biradial blade, the analysis of the outermost shell is shown to be sufficient. Sufficient approximation is obtained when the first two terms are taken in the series for internal forces. Finally, a still simpler method is indicated for the computation of very short shells. There are 9 figures and 11 tables.

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SUBMITTED: November 13, 1961

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